

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

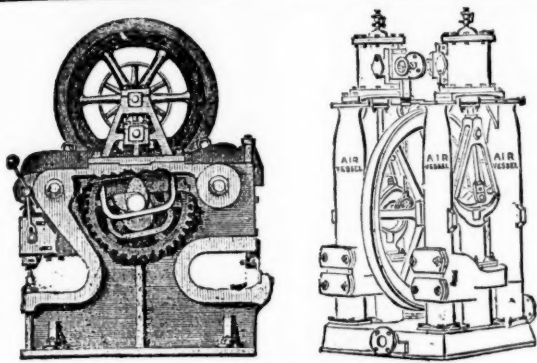
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2003.—Vol. XLIV.

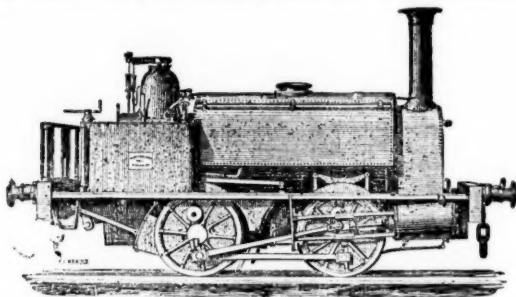
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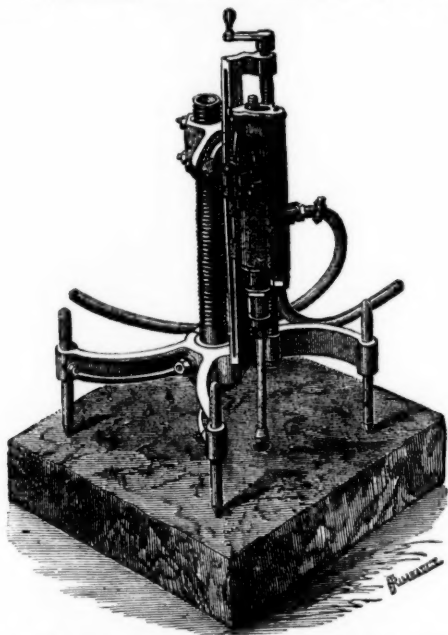
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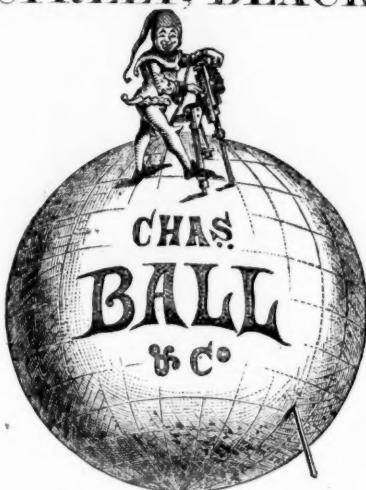
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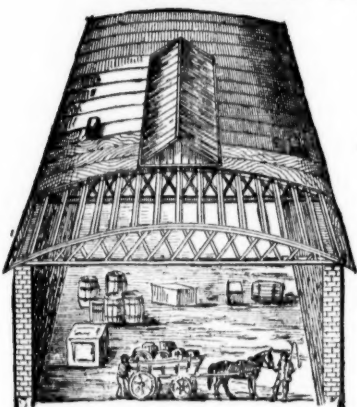
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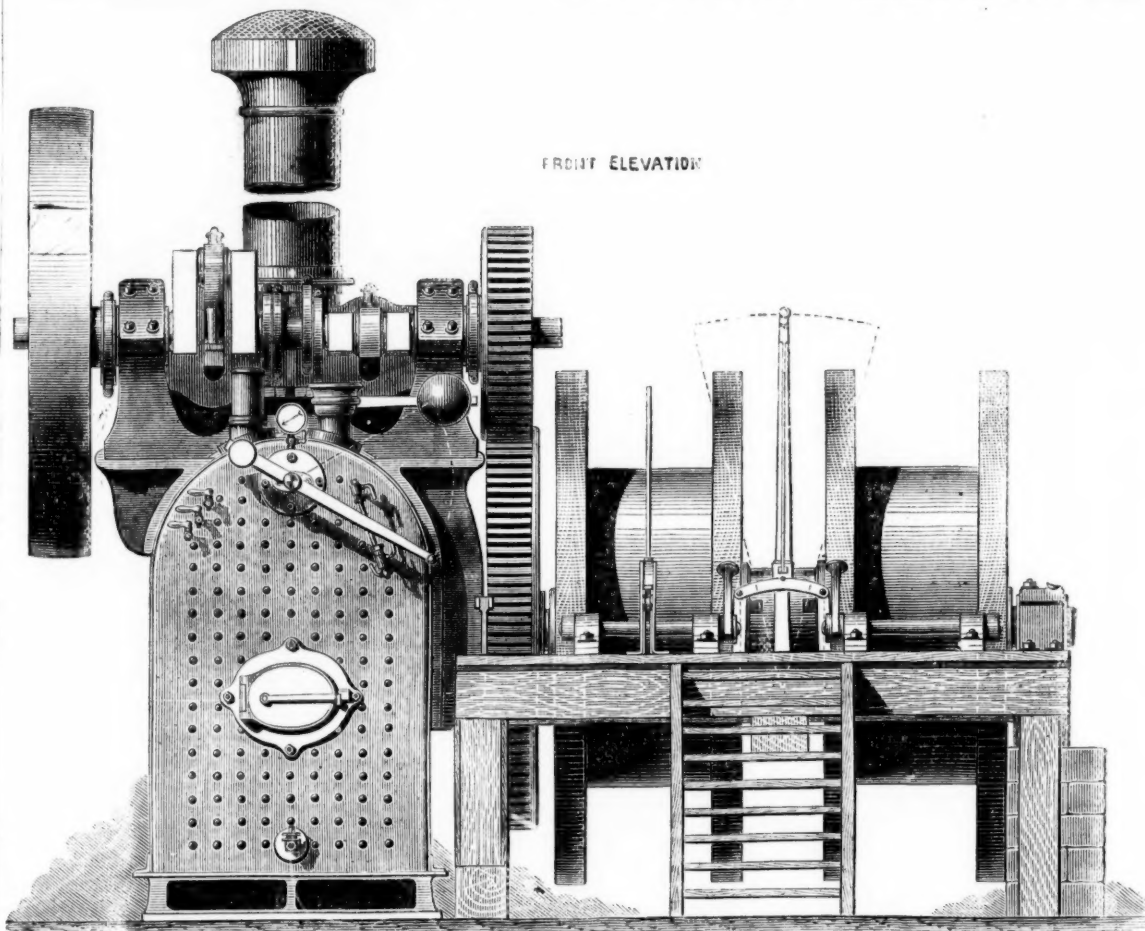
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## Original Correspondence.

## MINING IN UTAH—THE EMMA MINE.

SIR,—The controversy between B. A. M. Froiseth, of this city, and S. T. Paffard, has culminated in a somewhat deplorable manner in personalities. Facts, not persons, are the objects to be aimed at or vindicated, and Mr. Paffard, at least, ought to remember that a discussion to be gentlemanly must be impersonal. Of the two contestants Mr. F. undoubtedly has the merit of unimpeachable sincerity and disinterestedness of purpose; and Mr. Paffard, before writing his letter of the 15th ult., had better concede that neither resorts to ridicule, nor evasion of the disputable points, are valid arguments or honourable warfare. Mr. Froiseth never claimed to be a professional geologist, nor to state authoritatively the value of the "Emma" in dollars and cents; he simply controverted the statement of Mr. P. as to the mine being worthless, by contending that the sale, relatively at least, was a justified one, and would, no doubt, vindicate itself in due course of time. If anyone is to be held responsible on the score of geological shortcomings it is most assuredly the expert in charge, who at the request of T. W. Park, examined the mine and masticated it ready for the English market.

It is most assuredly an ungrateful and an almost hopeless task to try to redeem Utah mines in the English opinion; but the amount of insufficient information, of prejudice and misrepresentations wilfully circulated, may justify the writer in giving an impartial *resumé* of the mining status of Utah in general, and of the British mines in particular. The extent and value of Utah's mining resources, in a certain sense, have been rather overrated; there can be no doubt about it to any cool-headed and clear-thinking mining man. I say mining resources, and I mean by that not only the extent and intrinsic value of our ledges but, what is equally and sometimes even more important, the lack or presence of facilities; the supply of building material, of timbering and provisions; the easy accessibility at all seasons; cheap labour, cheap fuel, and an abundance of water. Paramount in importance there are the regularity and uniformity of deposits, the exemption from litigation, an efficient, honest, wide-awake management. Given all this, and the qualitative value of the lode is almost immaterial. In any part of the world the best paying and most permanent investments are not the rich mines, but the large bodies of (comparatively) low grade ores (*vide* Australia, England, Germany).

Mining is at best a lottery; both the gains and the blanks are incomparably larger than in any other kind of business. To the uncertainties which necessarily beset every commercial venture there join in mining life features vastly more radical and sweeping—rich strikes or pinching out, soft ground to work in, or caves, irruption of water, &c. Yet, not only is the extra amount of foresight, prudence, and energy, which necessarily is demanded in hazardous enterprises, usually sorely lacking, but even the commonest requirements of business life, good accountability, watchfulness, foresight, and integrity are hardly ever met with.

The failures of most of our foreign mining companies here would exemplify this in one or several of these instances. In looking over the doleful list of English investments here, such as the Tecoma, Flagstaff, Emma, Utah, Camp Floyd, &c., a careful observer is easily enabled to assign to each one its true cause, and the satisfaction of seeing one's provisions realised is not a very gratifying one. Wilful deception, and self-deception, recklessness, carelessness, unbusiness-like habits, incompetency, stock-jobbing, extravagant salaries of officers and employees, litigation, improper organisation, and sometimes even dishonesty—these are the causes of disappointment and failure to our British cousins. It is needless to particularise, and to point out the respective applicability of these assertions to each of the above-mentioned concerns, as every shareholder and honestly inclined mining superintendent will only too willingly endorse their appropriateness. It is a great mistake among shareholders to subscribe to, and an equally great one for mining experts to report on, mines solely in view of the quality and quantity of ore exposed. When I first visited Cottonwood at the close of April, 1870, and saw the wretched state of communications, I gave the people there credit for a great deal of Chauvinism, or ignorance of mining, or both, to talk so blusteringly as they did of the scores of fortunes which were up there in store for them. Though, when speaking of "fabulous riches" and "untold wealth," I could afford to hear them quietly, because I knew, from long experience, the difference between wealth *in situ* and wealth in the pockets of the investors. Another and more fatal mistake which British shareholders are apt to make is the overstocking of mines. It seems to be a fatality which drives them to subscribe only for the most expensive and the most foolishly or criminally extravagant schemes. Sound and really deserving mines do not need any artificial bolstering, and there are but very few ones in Utah that at any time during the last three years could not have been purchased at a price below \$100,000 from the vendors themselves. But a great deal of responsibility rests with the English promoter. Pandering to the widely-diffused notion that only ballooned up schemes will take with the English public, and yielding to his own unscrupulous cravings, he floats a mine which had been offered to him for (say) \$50,000—for \$100,000, \$200,000, even \$500,000, reserving for himself, of course, the lion's share. It is to be regretted that such a prejudice should exist; but that it does has been only too often verified, and it has as well been referred to and deplored by English mining men themselves in the columns of the Journal and other papers. As a community, we would rather be without such mammoth schemes. So far from being a guarantee of success or a matter of pride to us, they are almost sure to end in decay and ruin. It does not bring us a cent additional gain if a mine, instead of being stocked for \$100,000, is stocked for \$500,000 so long as the capital subscribed is sufficient to defray current and developing expenses; but it is very probable that in the latter case the concern will go to the dogs. None but low and venal people, and none but a servile press, could applaud transactions such as have taken place at various times from this Territory of comparatively worthless properties for extravagant sums. The sale of the Dartmouth, Belshazzar, and Red Warrior to the United States Mining Company (Limited), for the consideration of \$450,000 was, outside of a certain class of people, deeply regretted by the community. It appeared to some more perspicacious or less hypocritical than the others that this transaction was the first ring in the death-knell of Utah, and so it has happened. Next came the Emma operation, the floating of the mine for \$5,000,000—a consideration which some old fogies here thought was just about five times over and above what the property was really worth. Then the Camp Floyd (Sparrowhawk) fizzle; the Tecoma, the Last Chance, the Flagstaff, *ad nauseum*.

Mines, let it be remembered, ought to be viewed like investments on transatlantic steamships; they ought to pay for themselves in twelve months. Even the payment of the vendors, wholly or partially, in shares will not, as the "Utah" transaction has demonstrated, save the *bona fide* shareholders from discomfiture, the vendors having it sometimes in their power to bully up the stock sufficiently to sell their shares.

The only mode to acquire a really deserving property for a moderate figure, and to have it worked in a thoroughly trustworthy manner, is to enter into connection with one or several joint owners of a mining claim, furnish the capital and develop the mine on shares. Of course the capitalists would own the controlling interest in the concern, the original owners or locators only retaining so much as would ensure their unflinching co-operation in the success of the enterprise. This, in theory, is undoubtedly the best plan—it would benefit the contracting parties direct, and would make the greatest good faith on both sides indispensable. But in practice the plan may present many difficulties, one of which, for instance, is that of entering into mutual relations. A Mining Bureau has been, and still is, being sporadically started in various parts of the West to meet the want; but however honourably, to all intents and purposes, it may have been organised and be conducted, yet occult influences begin to manifest themselves sooner or later, private interests to crop up, to reduce the Bureau down to their schemes and to their purposes. It does not take very long to swamp the reputation of the respective Bureau, and similar institutions, for ever.

Where two or three or half-a-dozen shareholders club together and co-operate heartily, sincerely, they will succeed in making money in Utah as well as anywhere else; but the larger the number of shareholders the greater the inducements for "jobbing." This is true, not only of mining but of any kind of industrial pursuits. Where the shareholders have not a professional man among themselves to come and examine the property (which is always the most desirable), they will exercise the greatest vigilance in selecting an agent competent, sober, incorruptible. In most of the mining companies the disaster begins with the report of the examining engineer (of course he cannot be held responsible for ulterior frauds, such as dabbling in stocks, &c.), but it is safe to say that in four cases out of five the woe and wail of a mining company depend on his disinterestedness, his sobriety, his experience, and knowledge. And in this connection, let me say one word about American mining engineers and American geologists.

The expert in charge of the Emma was an American, it is true, but who godfathered the Tecoma, the Last Chance, the Camp Floyd (Sparrowhawk)? Who engineered through the Utah property in spite of the American consulting engineer's warnings? Who were successful in running down the Flagstaff Company's shares from 14¢ to 3¼¢ in less than eight months? Were they not Englishmen? Which American mining inspector would have taken \$50,000 for doing nothing, or at best doing mischief? Would we Yankees have left two furnaces cold during two months, under pretence of building others, and sold our ores meanwhile at a loss, if we had not had motives other than those of sheer laziness and carelessness? I venture to say hardly. What our brethren beyond the waters may think of their representative countrymen, Messrs. Brydges Williams, M.P., and Geo. Anderson, M.P., who came here nearly two years ago to examine the Emma, Utah, Camp Floyd—they know best by themselves. Mr. Paffard, for one, may continue to declaim against the absolute worthlessness of all American mines, and the utter depravity of American vendors; but so long as we fail to see that British investors are doing their best, or doing even a little towards holding their own, so long we shall contend that there is money to be made in Utah for those who are willing to take it, and who know how to do it.

Salt Lake City, Dec. 12.

## COLORADO MINES AS A FIELD FOR INVESTMENT.

SIR,—From my previous letters you will have seen that my principal object was to point out the solid advantages presented by Colorado mines as a field for the judicious investment of English capital, and as a warning to avoid the schemes, as plausible as they are fallacious, which professional speculators are continually trying to palm off upon the English public. It is the heavy companies that have so long depressed mining in Colorado; hundreds of thousands of dollars have been spent over and over again on mills and other reduction works before the mines have been thoroughly explored to ascertain the quantity and quality of the ore, and, when finished, have as often been found utterly worthless, or have remained idle for lack of material to keep them in motion. It was, therefore, with deep regret that during a recent tour through Park and Summit counties I observed the same suicidal policy being carried out by an English company in Hall Valley, Park county. This company has purchased a number of lodes and locations on the very crest of the Rocky Mountains, most of them above timber line, and for seven or eight months of the year nearly inaccessible. The principal one, the Whale lode, has a pay streak of from 6 in. to 2 ft. of low-grade ore. To every practical miner here it is well known that these mines can only be made to pay under the most advantageous circumstances, while their almost inaccessibility can scarcely fail to bring failure on the undertaking. Again, this company, like their predecessors, are expending thousands upon thousands of dollars upon railroads and mills before they have explored any of their mines, except to a very insignificant extent, and before they can know whether or not they have any ore to reduce.

Let intending investors come out here, and with the assistance of some uninterested practical miner personally examine the mines of this and the neighbouring counties of Park, Summit, and Boulder, and they can find investments as good as that of the famous Park Pool Association, which in three months of the present year divided \$30,000 on a paid-up capital of only \$20,000. DANIEL ROBERTS, Georgetown, Clear Creek Co., Colorado Territory, U.S., Dec. 16.

## MINING IN ARKANSAS—KELLOGG GRAVEL HILL.

SIR,—Some friend has had the kindness to forward me a copy of your great Journal of Nov. 29. To say the least for this distinguished kindness, I hardly know how to be sufficiently thankful. From it I have obtained more information in regard to American mining interests than in a dozen of our most extensive mining and railway journals—even a special devoted to the great lead mine nuggets of Joplin, Jasper county, Mo. But from the depressed state of affairs in this "neck of the woods," I am fearful that but little effort will be made to develop the greater mining interests of the Kellogg Gravel Hill silver and lead district of this county until next spring or summer. And from this depression of financial affairs in the great south-west, it affords the English public an opportunity for investing in one class of wild, undeveloped, though reliable mineral lands that will not occur again in all probability in a lifetime. Reliable mineral lands, both silver, lead, zinc, or iron, the Beidler out-cropping ten-acre tract of good silver-lead, or the Watkins' eighty-deep diggings; the Moreland, or the Nieman Gravel Hill Kellogg, with developed mines, each tract of 160 acres can be purchased at nominal figures. These mines, outcroppings, and hills are profusely filled with ores, which assay as much as 313 ounces of silver to the ton, and 63 per cent. of galena. Specimen ores of the Gravel Hill, at Messrs. Baring Brothers, unless deposited in the British Museum for public exhibition, I should be glad if some responsible English assayer would get possession of that sack of precious ores and assay it for the benefit and information of the English investors in American properties. Your English capitalists would be somewhat surprised at the large amount of precious metal contained in a lot of refuse "offal" ores picked up around the old Gravel Hill pit or mine, which has not been worked for more than 20 years. In fact, there has not been any mining of importance prosecuted in that "neck of the woods" since the war, the cause being want of mining capital. If the lot of specimen ores before mentioned were assayed and the results published, I doubt if mining property as reliable as the Kellogg Gravel Hill would longer remain idle for the want of adequate capital to delve among its undoubted rich ores, which will bear the strictest investigation, and can be purchased at \$100 per acre. Thousands of acres of reliable undeveloped mining lands can be purchased here at from \$5 to \$25 per acre. And I am in a position to state, from a thorough knowledge of this county, and, in fact, the State, with regard to her mineral treasures, that though to a great extent yet undeveloped, the day is not far distant when this State will more than rival the Nevadas in its yield of silver-lead ores.

If some of the new companies organising for investment in American mining shares and prospecting companies stocks would include Arkansas in their yearly rounds in search of reliable mineral lands in the Far West, beyond the great Father of Waters, and would furnish genuine information as to the selection of mineral lands of real merit, whether purchases were made or not, many thousands of pounds would be saved; and the large number of mining engineers annually sent to the mountains by English companies would, I am sure, be directed to prospect the richer ore fields of the Kellogg lead-silver or silver-lead district of Arkansas, particularly the Gravel Hill outcroppings and mines of this county. S. H. NIEMAN, Little Rock, Dec. 20.

## ROCK-DRILLS.

SIR,—In last week's Journal "R. B." says (alluding to Rock Drills) "the Excelsior seems to have but little inclination to work at all." Allow me, as the inventor and patentee of that drill, to inform "R. B." that whenever he pleases to come he shall see the Excelsior rock-drill penetrate hard granite at the rate of 4 in. a minute with a pressure of 25 to 30 lbs. per square inch. He shall also see the same drill commence to work with a pressure of 12 lbs. per square inch,

and he shall acknowledge that the instrument is simpler, and composed of fewer joints, than any rock-drill yet made.

E. EDWARDS, Engineer and Patent Agent. Southampton-buildings, Chancery-lane, Jan. 8.

## THE MCKEAN ROCK-DRILL.

SIR,—We reply to "Readers of the Mining Journal" of last week, that it is immaterial for all practical purposes what the nature of the stone may be on which our drilling machine is put to work. To what extent a succession of blows made by the piston upon rock of the most extreme hardness will affect the solid piston itself, as compared with the effect upon it of the same force exerted upon softer rock, is only to be determined after lengthened working and by careful comparisons. What we affirm is, that the working of the machine in whatever nature of material does not tend to break or derange any part of the mechanism. A block of copper furnace bottom was lately sent to us for experiment, and said to contain from 70 to 80 per cent. of pure copper. With an ordinary pressure of steam the machine would bore this at the rate of (say) 2 inches per minute. It will bore in Aberdeen granite 4 to 6 in. per minute with a plain round bar of steel, without any point whatever, but no great depth could, of course, be attained for want of clearance.

Your readers will, probably, have to fear that much of the correspondence relating to rock drills thus far is more than anything else a partizan appreciation by each writer of the particular machine in which he is personally interested. It is for this reason that we have heartily supported the proposition for a public competition that would enable all parties interested to judge of the merits of each machine when reported on by a thoroughly competent and impartial jury. Without further trespassing on your columns to show, as we might, the estimation in which our machine is held, by the fact of its rapid extension to various parts of the globe, we will content ourselves with again expressing the hope that some arrangement for a general trial will be accepted and carried out.

At a future time we should be glad to discuss the question of air-compressing machinery, as we think Mr. Ball has given his endorsement to machinery for this purpose which is almost as "antiquated" as the "Mont Cenis Drill."

The advantage to the world in the means of producing wealth furnished by the application of compressed air, rock drills, and dynamite, is at present immense, and what it may soon become is incalculable.—32, Lombard-street, Jan. 8. MCKEAN AND CO.

## NOTTINGHAMSHIRE COAL FIELD.

SIR,—The collieries in Nottinghamshire are being rapidly pushed forward, and will be of the first magnitude, and when complete each colliery will have an output of 1000 tons per day. At the present time there are New Watnall, Newstead, Linby, Bestwood Park and others; at each colliery they are sinking through the magnesian limestone. The eastern part of the county has an inexhaustible supply of coal, and in a few years will be one of the largest and most productive districts for the number of collieries, as the estates run very large. Where the kings of England, bold Robin Hood, and the noble friars chased the deer in Sherwood Forest we can now see large chimneys rising on all sides, showing that the immense riches that lie under the royal hunting field are being developed. Forty years ago it was generally believed that the coal measures were not even supposed to lie underneath the immense forests, and some of the estates have changed hands without reserving their mineral rights; but as it is now understood that they are under, and no doubt they extend to the east, their development is only a question of time, as the depth will be great. There is, however, an advantage even in that, as deep coal is easily got, and would not require coal-cutting machines to hole it, as by the superabundant weight and the pent-up gas renders the coal can be easily got, and labourers can be employed to fill the coal, wooding being the principal part of work.

No doubt the coal resources of England will be very much drawn upon, and that many collieries will be worked out in 10 or 15 years, but there is an abundant supply from Doncaster, 60 miles south and south-east, and no doubt it will become one of the future coal fields of England. There is also an immense quantity of iron ore in Lincolnshire, which will eventually be worked when the railways are opened, as it is got with less expense than the clay ironstone. Supposing that the great Midland coal field should not only extend into East Leicestershire but that it should continue through Rutland and Northamptonshire, the fact that the boring in the South of England has again proved that the secondary formation thins away and is often wanting in some localities should not prevent us from believing that coal exists nearer London than is anticipated. If we could raise our coal where we have an abundance of iron ore we may still keep our position as an iron-producing country.

ADVANCE.

## COAL A DANGEROUS CARGO.

SIR,—Under the above heading I lately addressed to you a letter in which I pointed out the dangers of explosion attending the conveyance of coal on board ship, as evidenced by several exhaustive enquiries made under direction from the Board of Trade.

That explosion is not the only danger to which a vessel carrying coal is subject, from the nature of its cargo, cannot be doubted for a moment. There is another, and perhaps more serious cause of accidents in what is termed "spontaneous combustion," which assumes especial gravity from the fact that it is only on long voyages that casualties arise from it, which are themselves confined to one particular branch of the coal trade—to that carried on with the South Pacific Coast. The smelters of Chili and other South American States, being in want of cheap coal, are, naturally enough, supplied not only with the cheaper sorts of small coal, but by preference with those small coals which cannot find a better market in England or in Europe generally. Of this particular branch of the coal trade, Swansea has practically a kind of monopoly.

Generally speaking, the coal shipped from Swansea and two or three other Welsh ports for the South Pacific Coast is almost exclusively bituminous, or what is commonly called "binding" coal. It is much sought after, owing to the facility with which it may be mixed with the coal of those southern countries to which it is exported. It is chiefly supplied from collieries situated in the neighbourhood of Swansea, and oftentimes it is shipped "through and through"—that is to say, large and small, just as it comes from the pits. But, inasmuch as the largest of this description of coal fetches a higher price at home as house coal, the cargoes made up for the Pacific generally contain a larger proportion of small coal, from which an increased liability to ignite arises as a matter of course.

It is not an unusual practice among colliery owners to keep a stock on hand, which is frequently left without any shelter, and much exposed to moisture. Other coalowners send their coal from the pit directly to the ships, but then it is, as a rule, shipped wet, as it is generally moist when got out, and subsequently exposed for some hours to the rain in railway trucks, besides having, on account of its smallness, absorbed much more water than it would if it were in larger lumps. The coal thus shipped will only be partially dried by the wind, and not until a considerable time has elapsed. From either of the two causes stated it follows that the coal on board ship must always be and remain more or less wet, whereby its liability to heat and to ignite is naturally enhanced.

Bituminous coal is the kind mostly chosen for exportation to the Pacific, on account of its binding or caking properties, which, as I have said, make it more suitable for mixing with the native or anthracitic coal for smelting purposes. Now, this bituminous coal is still in progress of decomposition, that is to say, it is still passing through those stages which have already been gone through by steam-coal and anthracite, and this forms an additional feature of liability to spontaneous combustion with which the South Pacific coal trade has to contend.

There is yet another substance often to be met with in the kind of coal alluded to, and which may be termed the greatest defaulter in the matter of spontaneous combustion. I am speaking of iron pyrites, or bisulphuretted iron, which some coalowners hold "ought not to be found in coal intended for so long a journey;" but it is found, and sometimes in very large quantities too. To this injurious

substance may be traced ninety-nine out of every hundred cases of spontaneous combustion.

Thus, the causes from which spontaneous combustion arises on board ships carrying coal to the Pacific coast may be classed under four heads:—1. The bulk of the cargo and the smallness of the coal. 2. The presence of moisture. 3. The liability to progressive decay. 4. The chemical composition of the coal.

The first two causes require the existence of either of the last two, but no one of the causes enumerated can produce spontaneous combustion by itself.

In my next letter I purpose to show how the spontaneous ignition of coal possessing at least three of these four injurious properties is brought about.—7, Carlton-square, New Cross. A. VASSARD.

#### ON OPENING MINES FROM SURFACE.

SIR,—As the columns of your valuable Journal are always open for the discussion of subjects appertaining to mines and mining, and that you have many very able correspondents on such topics, will you please allow me space for a question on Opening Mines from Surface. In the first place, no doubt you are aware that Cornish mining on metallic lodes is started generally by vertical shafts sunk on the hanging side of the lode, with a view to intersect the lode at a given depth, varying, I may say, from a few feet only to 150 fms. or more. Then the shaft is turned on an angle with the lode, and when the vertical part is several fathoms deep, cross-cuts are put out to cut the lode at every 10, 12, or perhaps 15 fms. in depth, &c. The question is, Why is this plan chosen in preference to that of sinking from surface in the lode? We must allow, "exceptions will creep in in all rules," but take this matter as a general rule. Perhaps the engineer will step in and say, "Give me a vertical shaft for my rods and pumps to lift the water, and the engine shall give better duty. Economy in coals." So far so good. But when the shaft intersects the lode, and is gone off with it, forming a heavy angle in both rods and pumps, what is it then? To this end: Suppose we sink two shafts—No. 1 shall be 50 fms. vertical, and 50 fms. on course of the lode, say an angle of 45°, total 100 fms.; and No. 2 shaft shall be one straight line on course of the lode on an angle of 45° from surface, attaining the same vertical depth as No. 1. In which of these shafts would an engineer place his rods and pumps with a view alone to economy for raising any given quantity of water, allowing each shaft would have the same quantity; and in which shaft would he prefer hoisting rock, &c.?

In years gone by, I have understood that vertical shafts were sunk with a view to economy in pumping and hoisting alone; lately nothing has been said. There is no room for the least contention, in my view, about a vertical shaft being the best in every respect, for pumping and hoisting at all events; but when those shafts cease going down vertical, but are sunk on the lode after it is intersected, I am persuaded it is the most costly shaft known; and as almost all shafts in Cornwall are partly vertical, and partly an incline, I consider Cornish mining companies labour under a very costly mode of both pumping and hoisting. At all events, there ought to be a very large difference in favour of the shafts started vertical for pumping and hoisting, as such work, including cross-cuts, must be very expensive, compared with sinking in the lode, to say nothing of the disadvantage of not seeing the lode while the shaft is sinking and the cross-cut drifting, and when the cross-cut strikes the lode it is only, as it were, pricked into with a pick; and as rich lodes have their poor points, and a cross-cut should strike one of them, it might produce a very unfavourable effect on the concern. In fact, instances of that kind have been known to stop the mine. Had the same money been spent in openings made in the lode, dividends might be accruing.

As I have said, "exceptions creep in in most cases;" but it appears to me there is by far too much money expended in vertical shafts and cross-cuts. I scarcely notice a report but what has something of the kind in it. Let the openings be made in the lode, and it must be a very poor one if it does not produce some mineral to assist making the explorations, while you have a daily knowledge of what the lode is like. I shall be highly pleased to see some of your correspondents take this matter in hand, and hope to find that some will do more justice to it than myself. For instance, Mr. Ennor, who, probably, has had 50, or 55, or may be 60 years experience in such matters, can, no doubt, throw on it some important light.—*Ontonagon, L.S., Dec. 12.* A MINER.

#### MINING IN THE COUNTY OF YORKSHIRE—No. I.

SIR,—I beg to hand you a few remarks on some of the several lead mines now working in this famous mining district—*i.e.*, lying between Skipton and Pateley Bridge. This district, though exceptionally rich, is in reality but little known, and that from two causes, both in favour of it; the first one being that the lead ores are not sold in the usual manner to smelters, but are smelted on the mines and then sold by the companies as pig lead; the other one is that nearly all the mines are worked by the landlords themselves, or by private parties in the neighbourhood. The situation of the mines is admirable for freedom of working. I shall first draw your attention to the famous Cockhill and Sunde Mines, which are situated within three miles of Pateley Bridge railway station, and close to a village called Greenwhill, which are both inhabited with miners. These mines are in the limestone strata, and traversed by several lodes, I should say from 12 to 18 east and west, besides cross lodes. The above property is known (according to the history of Nidderdale) to have been worked long before the Christian era. A pig of lead was found in some old workings in a hill called Coadstones, bearing the name of Julius Caesar, with several other pieces also bearing his name, which I believe are now to be seen in the York Museum, and close by is one of the champion lodes of the district, which has been for a long distance worked away to a considerable depth by the ancient miners from surface. The lode is between 4 and 5 fms. wide on surface, and the hillocks are all covered over with 2 or 3 ft. of thickness of peat. Lately a few miners and lads in the neighbourhood has taken them to pick over and dress on tribute, and are making very good wages. I called by and examined the lodestuff, which was chiefly composed, the same as most of the bearing lodes here, of barytes, crystallised spar, carbonate of lead in abundance, and solid pieces of potash ore, which weighed from 7 to 12 lbs. I may remark that if these hillocks were all removed and crushed, and a few self-acting patent jiggers, with slime-pits, &c. used, I have no doubt that a fortune might be derived from this place alone. There are also several parallel lodes within 20 fms. of the great Janet lode, which has never been touched below the surface. There is a company now formed to work the adjoining ground eastward, and resume the driving of a deep adit level in the direction of Loadstones, which is the boundary of both properties, and will, no doubt, be of great value to the Cockhill and Sunde Mines, because they will have full power to resume the driving under the old workings already mentioned, and will be about 100 fms. below surface, which will, in my opinion, make a splendid lode by itself, and will enhance the value of Cockhill and Sunde Mines. These mines were placed in the hands of the present landlord and proprietor's grandfather, with 12,000*l.* debt; he began an adit level (or a long cross-cut), discovered two new lodes, paid all the debt in six months, held the management for 50 years, and made a fortune out of the mine. During that time they paid 1-16th royalty, lead only realising 12*l.* per ton; they have been paying good profits ever since by stopping the ground above the adit level, and have several partnerships raising ore in different places, yielding on an average from 1 ton to 2 tons of ore per fathom. The royalty now is 1-12th, and lead 23*l.* per ton. Nothing has been done to prove the value of the lodes (which have been so rich, yielding several thousands of tons of ore above the level) below the adit level, beyond sinking a shaft 20 fms. deep when they were watered out, the lode being nearly 6 ft. wide, composed of gossan, barytes, spar, and a course of ore 18 in. wide. Now they have erected a steam-engine underground, 50 or 60-horse power, with a 12-in. plunger-lift, drawing-machine, &c., to drain the water, have laid lead pipes to convey fresh water to feed the engine, and will soon be ready to resume their sinking again, stop away the ore, and increase their dividends.

The next property west, which is close to the workings of the

above mines, is called Craven Moor Mines, in the same strata and on some of the above lodes. This property is 2½ miles east and west, and about 1 mile north and south, and joined on the south by Barhill Mines, and north by North Rake Mine, and on the west by Appletrewick Mine, and the famous Duke of Devonshire's mines, called Grassington Moor Mines, which have been paying upwards of 70,000*l.* yearly profit, and the lode in the deepest part of their workings is of an immense width, containing splendid branches of lead ore, being the same range of ground as the Craven Moor Mines. Craven Moor Mines are known to have been partly worked from time to time on tribute by miners in the neighbourhood sinking small shafts from surface (upon the lodes, and no doubt large quantities of ore raised) as deep as they could with water, and all the lodes which are seen cropping to surface are of a promising appearance, such as are chiefly making large deposits of ore here in depth, chiefly composed of barytes, gossan, spar, &c.; and the same lodes in Cockhill and Sunde Mines have proved rich about 50 or 60 fms. below the deepest point yet reached in Craven Moor. These mines are now in the hands of a mine agent in the district, who has made several trials, which have already proved very successful, and are likely to make one of the best concerns in the country.

They are now sinking a shaft upon a new lode, which has not been touched in the property before. They are now down about 10 fms., and have driven 6 fms. west, and have already raised and dressed about 20 tons of lead ore, and have several tons now on surface. I am informed that the lode in the bottom is all that can be desired, being nearly 6 ft. wide, composed of barytes, crystallised spar, gossan, and a course of ore worth, on an average, 2 tons per fathom for the whole length, the minerals, &c., being alike, as the lodes generally are when close to a large deposit of ore here. They are also bringing a deep adit level from the western end of the ground towards the new workings on surface, which will be about 60 fms. deeper than the new shaft. I believe that the forebrest of the level is in a powerful lode, with a course of ore to drive upon, also being in easy and favourable ground for driving, and several other parallel lodes which may be intersected with a short cross-cut. They have made other trials, which are, as far as one may judge, likely to turn out well. I may remark that I have never seen a more promising concern (which is, in my opinion, another Van) in Yorkshire. Great activity prevails in the district, owing to discoveries made in Craven Moor Mines. VERITAS.

#### N. ENNOR ON PRACTICAL MINING.

SIR,—I notice that it is generally supposed I am an enemy to practical mining men; that is not the case; they are their own enemies, through not mastering their own subjects. No man in England has ever stood his ground and fought the book-taught and theoretical men as I have done, and I have had no difficulty in keeping them at bay. I have ever said it is a matter of impossibility for any school or college to convert a "professional" into a "practical," let his abilities be what they may. A man to be a practical must go into the earth, and work a portion of his time. To know mining he must work, and observe Nature's freaks, and learn a portion of the golden laws. This to appearance is a hidden thing, and only to be learned and laid open by the expenditure of a vast amount of money, and then only by artificial lights. The formation of lodes and ores is the most complicated thing to unravel, but the day will come when a deal of these hidden secrets will be better known. The best move that I can see in the right direction is the rising home institution where the young men from the mines meet. They are mostly working miners, men of the district, with often an old stager hard by listening. This in time will certainly open some of the leaves of Nature's beautiful book. Then every one of the weekly teachers will be selected from men who have driven the wheelbarrow, and not from the schools. I ever contend that the schooling begins at the wrong end; it teaches the youth old bygone tales; they are all but imaginary, their teachers never knew the real interior laws of the earth; they teach only old imaginary tradition, selected from old books, written hundreds of years since. It is a treat to read them, to see how they disagree, and what a mess they make of it when they tell the pupils that every hill was a melting mass, and that at seven miles deep it is melting still. It is an error to teach young students to believe these vague tales. These men have told the time the first sun or world was cooling down, but I am not aware that they have given the date of the first kindling of these asserted interior fires, or what kept them up afterwards. When these students have sufficiently imbibed their theory they are sent out to teach mining youths—that is if they have thoroughly imbibed the teachers' views, if not they are neither sent out as tutors or in situations at home or abroad. The error is that these young men are educated by those who never saw the interior of the earth: they might as well open a school to teach man the interior laws and contents of the moon. I admit they stand on the earth, but they know not a single law which governs its interior. Now, the Bible goes so far as to tell us that the globe was surrounded by water, and God gathered it together, so as to leave dry land sufficient to support the earth's inhabitants. Then, I may ask them to kindly tell us when the interior fire was lit, and for what purpose?

I leave this subject for the present, and turn to the young mining practicals. I tell them the first thing they should attempt to learn is to discover from every good and productive mine they go into what causes the lodes to form masses of ore, then see if they can find a single prolific mine with neither intersections of lodes, slides, elvans, or sudden changes of strata; then see how these and the lodes meet each other. It is not every intersection that takes place in lodes which causes masses of ore to form; it is more dependent on the direction they meet each other. If they learn this they will gain knowledge. I may notice that the strata of scores of the call-paying mines may be good, and traces of ore may be seen to run through the lode, but they never yield massive or paying ore. Then try if he can discover whether the intersections come in at the same angle, or a different angle from what they did in the paying or productive mines; then they seldom or ever make productive mines. Young men should make themselves masters of these things, and a hundred other subjects on Nature's freaks that they discover in the interior of the earth.

Read as few theoretical books as possible, till you gather your own views, and build them on the earth's own laws, and study them well. You will feel convinced that masses of ore are only found at or near certain intersections. This will soon convince you that these intersections cause the ore to form at these points, and the ore, like all other things in creation, grows. When these things are mastered you will have learned your first lesson, and will not be easily turned from it.

Then go and hear the theoretical teachers, and read a hundred of their books, written by different authors. Then notice how they, like the priests of old, glide along in the same old path. Then see, and carefully study, the facts you have learned. Employ your time by hard work in the earth, your natural book. The best site to gain mining knowledge for the next century is in the earth, as it is not to be learnt in professors' schools—they only polish.

One great drawback to young practicals are the first rudiments of education. These he is now bound to get under the new school law. A few weeks since, when riding in a van, I fell in with an intelligent young man. No one could tell me who he was. I soon discovered he was studying mining laws. I am not aware that he ever wrought as a practical in any mine. I rather thought he was school taught; but he is in a very fair way to get on. I since discovered that he was a mine school teacher, and was on his way to a small mining town to teach young miners, a very good move. Next, turning to mine reporters, I argue they should be good practicals. Some may say their name is legion. I am aware that there are many so-called practicals, and they, like most other trades or callings, can do a fair day's work in a day, but the majority of them can only be classed as good day labourers as miners: the only thing they study is how and where to get the most money—they soar no higher.

Then comes another class of men—men who never wish to meet a hard day's work. They use every means to avoid it; they often pretend that they are ill, or tell any lie to avoid work; they endeavour to lure their comrades to the beershop, instead of going to

work, and particularly if they are in the night shift, and can shun the captain. These are a dangerous class; they will tell any lie as to the prospects of a mine, and particularly so if it is under water. They make unwary men believe what they say is truth; they often get them to work old poor mines, where a great many of them get in as agents, but they seldom get a paying mine. These men never study a single law of Nature, they never attempt to open a leaf of that book—a book that contains only golden rules. When they get in as mine agents they are very pompous and consequential, and naturally lazy. Not one in fifty of them knows what the ore they raise is mineralised with, what produced it in the lode, or whether it was formed there at the day of the earth's creation or has grown since. It is through these men that so many call-paying mines are now at work. These men know not when to stop worthless mines.

Many men, and even adventurers, suppose and say that these call-paying mines should be wrought in order to keep up the dividend-paying ones, but I say not half of these mines have a single chance of ever becoming paying ones. It is here we make the great mistake; not one in twenty will ever pay outlay and interest of money. I know a Cornishman, one who gives good statistical accounts, who often tries to prove that mining pays a very high percentage; but he, some time since, let it slip out that the average of mining pays 3*l.* out to get 1*l.* back. But I now throw down the gauntlet against any man to show that the calls at this time are not 50*l.* paid out to 1*l.* return. See the Dividend List: it is a mere farce as to the mines that stand in that list as dividend-paying ones. There are fifty odd for the two western counties; then, who will show me that four of them pay dividends over the interest of the money the shares are purchased for. Then, the call list shows 110 mines; in that case we may say that the Cornish and Devonshire mining days are over—that is, so far as profitable mining goes. Then, what caused it? Are the captains making bad selections, or badly managing the mines? I say it is both.

Then come the shareholder and mine promoter, bringing out mines with 60,000*l.* and 100,000*l.* called up capital; many of them old mines which I have inspected, and that, I say, have not one chance in twenty to become paying mines, even if brought out at only 20,000*l.* Then they, to raise the wind and get the 100,000*l.* paid in, go so far as to change agents, and pay dividends out of the paid-up capital. It will only surprise me if the outstanding shareholders ever get a copper of their money returned. It serves them right; here are the two classes met—the knave and the fool. I need not ask which will win. I may further remark that Cornish mining is now at the turning point. It must either reform or collapse. I say to those owning mines paying calls, throw up the majority of your shares, and sell quietly out of your dividend-paying ones, when shares will drop to a fair price. You may say this will be ruinous; then I say hold on, and lose all.

With your permission, Sir, I shall continue this, as I have not yet noticed the better class of captains, or how the professors licked them. N. ENNOR.

#### MINING, AND MINING ENTERPRISE—No. II.

SIR,—A review of the financial history of the past year indicates great strength and elasticity in the material growth of creative wealth, which add greatly to the prospective resources of the community. This stability and healthy state of trade, commerce, and manufactures has been developed, to use a graphic expression of the Premier's, through energy, enterprise, and good luck, not by "steps," but by "leaps and bounds," and although from foreign and exceptional causes we have had no fewer than 24 changes in the *minimum* Bank rate of interest, varying from 3 up to 9 per cent., we have, happily, had to contend against few commercial and financial disasters. There are only rare instances of grief to record during the year in banking circles, manufacturing centres, or in the industrial fields that find employment and sustenance for the masses. Wages have been fair—high in many instances—and despite the increased value of the necessities of life, both the material and social comforts of the people exhibit amelioration and enhanced prosperity.

During the last year new companies have been brought out representing 60,000,000*l.* in the aggregate, and of which 13,400,000*l.* has been called up, while companies previously created have sent into the market no less than 36,000,000*l.* additional capital, and succeeded in obtaining no less a sum than 23,876,200*l.* Foreign loans to the extent of 128,000,000*l.* have been floated, and payments of 84,662,000*l.* responded to. Thus making in these three directions a total investment of 121,942,200*l.*, with further liabilities of 102,057,800*l.* for the money market to find during the year 1874. All this investment of capital has taken place without the slightest mania for feverish and reckless speculation, and in spite of the continued and startling warnings afforded by Austria, America, and other countries, with the still keenly felt and crippling panic that culminated in 1866-7. France has paid to Germany the war indemnity. This speaks volumes in favour of the recuperative powers of France, and the immense sum transferred will enable Germany in the course of ten years to substitute a gold for a silver currency. The Bengal famine is a visitation of Providence, but the Ashantee war was aimless, and operations on the Gold Coast are most tantalising and irritating to that generous and most complaisant and indulgent old gentleman "of conservative proclivities"—John Bull. Under normal circumstances the promise of 1874 is cheerful and healthy. Is it not, therefore, most provoking that the prospect should be dimmed by the weakness of Mr. Gladstone's administration, and the untoward external events to which we have referred?

In speculative enterprise we have to record very satisfactory progress in British mines for the year 1873:—Van declared dividends of 75 per cent.; Dolcoath of 30 per cent.; East Pool of 77 per cent.; South Caradon of 1000 per cent.; Bampfyde of 20 per cent.; Roman Gravel of 37½ per cent.; Minera of 25 per cent.; Great Laxey of 37½ per cent.; Carn Brea, 17 1-7th per cent.; Lovell, 80 per cent.; Tincroft, 39 per cent. The half-yearly dividend of the London and Westminster Bank will be 12 per cent., making 24 per cent. for the year, against 20 per cent. for 1872. Union Bank of London 7½ per cent., and 24 per cent. bonus for the half-year, equal to 20 per cent. annually. This dividend is on the increased capital, yet the balance carried forward is reduced from 51,125*l.* to 20,815*l.* The Alliance will pay 8 per cent. annually, and the Metropolitan at the rate of 7 per cent. The National Discount Company 15 per cent. annually. The philosophy of opposition is most apparent, and while we admit that "the ways" of Providence are most inscrutable, we cannot but wonder that man in the height of his power and usefulness refuses to advance or to receive amelioration, divorced, from opposition. Nor is this opposition devoid of philosophy. The chick becomes an opponent the very minute it becomes hatched; the infant struggles for nourishment, and feeds on its mother; the rivulet is absorbed in the stream, the stream in the river, and the river in the ocean. Contention and opposition are the elements of animal and creative life, while the laws of gravitation effectively "oppose" the world's excision. Opposition is manifest in every grade and position in life. Its philosophy is admitted in the senate, the bar, the church; commerce, trade, and agriculture; the professions, the aristocrat, and the plebeian are alike imbued with its spirit, while progress is effected and sustained through its practical philosophy. But in no department of the world's industries is its birth, existence, and philosophy so evidently conspicuous, and practical, as in that of mining. Who so patient, industrious, and persevering under hopes deferred as the miner? Who opposes difficulties, disasters, and defeats with philosophy equally with the miner? The philosophy of opposition is on all sides not only apparent but universally acknowledged. On the day that Galileo died Newton was born, yet the former was brought to his knees at the age of 74 before the Inquisition, while the latter required the pen of Voltaire to record his fame. Railways and telegraphs were signally opposed; in the phalanx of contention are seen members of both Houses of the Legislature, statesmen and ministers, lawyers, divines, and laymen, with landlords and tenants, canals, carriers, and demagogues of every kind and character, yet the present generation could not exist without the use and locomotion of the former; nor could the commerce and social intercourse of the community be sustained without the latter. The reformation in "postage" was not effected without opposition; still, the whole world acknowledges the boon.

The Imperial revenue is advantaged, while the community is raised intellectually and socially, not only in mental culture and interchange of thought, but likewise domestic ties and relations are strengthened, "for distance constitutes no barrier" with the varied and ramified transactions of trade, commerce, and diversified business.

Who descends the shaft, opens the veins, and risks his labour, nay, even his existence, with equal fortitude, and cheerful alacrity, with the industrious and speculative miner? And who rejoices with such hearty, self-acquired, and honest satisfaction as the enterprising miner when success attends his labours? No chirp of Nature's plumage is half so cheerful. No heart throbs with more healthy delight, nor pulse beat with greater strength and power than the miner when his efforts discover the hidden chamber of wealth. He knows that its riches will reward his master, give increased stimulus to labour, add comforts and cheerfulness to the community of which he is a member, increase the volume of employment, of commerce, trade, and manufacture. The discovery of a good and profitable vein of ore not only enriches the owner and swells the nation's wealth, but it likewise stimulates enterprise, and encourages the desponding to fresh and renovated struggles for success. Herein is to be seen the philosophy of opposition, and probably at no other period, and in no other case, has opposition been so conspicuous, determined, and prolonged as in that of New Great Consols, nor its philosophy been so evident and recuperative as in the results achieved through the skill and practical joint management of Messrs. Phillips and Pryor. Still these gentlemen, satisfactory as he products already have become, would do well to carry their investigations yet further, for if we do not greatly err the ores contain, in addition to tin and arsenic, about 2 per cent. of copper and 15 per cent. of iron. Could not these be extracted and utilised, and do not the amalgamate when raised to the surface contain sulphuric and muriatic acid in sufficient quantities, easily extracted, to collect the copper, and with very slight additional cost? This, we admit, is more a chemical than a mining question, but our attention has been directed to the subject, and we have lately been present when intelligent authorities have discussed the feasibility of separation and collection, with confident anticipations of favourable results.

The amalgamation of New Consols and West Great Consols is now practically effected, under the title of New Great Consols (Limited), with a capital of 95,000*l.*, in 3*l.* shares. After incurring the heavy outlay in machinery and plant, making the dressing-floors, surface buildings, and other workings there remains in hand a large surplus. The introduction of this gigantic and valuable property to the notice of London capitalists will do good; it is chiefly due to the intelligence and energy of Captain Richard Pryor, whose experience with tin mining and tin dressing (two widely different qualifications) is most extended and varied, and whenever happily combined in the same person of double value to those who possess such services.

The New Great Consols was started under adverse pressure on the management, not only from the tenants, who apprehended danger to their crops, through the escape of arsenic, but also from the local agents, who ridiculed the appliances in the manipulations of the ores and improvements introduced in the dressing and separation of the amalgamated ingredients, yet all of them are now established to possess an independent and commercial value. It is a fact of graphic significance that 650 tons of ores, averaging 70*l.* a ton, have been brought to market, in addition to about 4000 tons of arsenic, worth (at present) 85*l.* a ton, (say) together 62,500*l.*, or on an average of 25,000*l.* annually since the starting of the steam-stamp—in the first instance, 36 heads (since increased to 60) about 2½ years ago. The chief attractions of this property consist in the facilities with which the products can be wrought, rendered marketable, and realised with advantage. At present the operations are restricted to the lode on which Phillips's engine-shaft is sunk to the 86 fathom level, or about 90 fathoms from surface—the conformation of the surface being all but a level and standing in the kills at the base of the granite that constitute the Kit and other hills, add additional interest to the New Great Consols property, as under very similar circumstances the Dolcoath, Cook's Kitchen, Tincroft, and Carn Brea, with East Pool, the Tolguses, North and South Crofty, and West Seton became great, important, and vastly remunerative enterprises at the base of the hills, and in and out of the junctions of the granite and kills bearing on the hills extending from Camborne through Illogan.

There are additional attractions in the compass of the company's grant—two other tin-bearing lodes standing to the south of Phillips's engine-shaft; upon one considerable shallow explorations have been made for copper, yet a close inspection of these workings show the existence of tin, and that, too, in unusually paying quantities. Still, time is necessary, and also moderate outlay, to render the lode of commercial value, yet the results may be equal to those already achieved on Phillips's vein; at its extreme depth Phillips's lode is freer from arsenic, more compact in character, exhibits more defined indications of tin-bearing qualities than in the shallower levels, and is worth at least 200*l.* per fathom for that ore alone. Its strength is significant of continuance in length and depth, while the mass of ores already in sight will supply the dressing-floors with work for many years to come. The second lode also contains tin, and is comparatively wholly undeveloped. This, as well as the others referred to, can be commanded by cross-cuts down to the depth of the workings on Phillips's lode. The pumping for drainage, with drawing power, being equal, with slight additions, to commanding the three. Just a mile and a half to the east stands the Devon Great Consols, which has yielded 1,100,000*l.* on 1024*l.* outlay. This lode is discovered in the northern part of the company's grant, and found at a depth of 2 fms. only from surface a compact quartz, crystallised, irony gossan lode, 10 ft. wide, identical in character and promise with its rich compeer. Trial shafts have been sunk on its course, and wherever intersected the component parts show the same features. Up to this time the lode is wholly unexplored in depth, and, regarded in a commercial view, the distance apart is ample to gather other rich deposits of copper ores, while the presence of an elvan course speaks volumes. The workings being so shallow only one drawing and winding engine of 24-in. cylinder is erected, but this will effect the work for years to come. In stamping a 36-in. cylinder is at work with 60 heads; capable of 36 additional being added, or, if required, 60. A Blake's stone-breaker of the most powerful description is at work, and utilises labour to at least 50*l.* to 75*l.* monthly, and the management fully recognises its advantages. There has been much discussion in respect to Branton's Revolving Patent Calciners but in respect to their superiority they are greatly opposed and questioned by resident manufacturers—i.e., the weight of metal and economy in construction create opposition; yet in the face of this fatuous controversy Capt. Pryor has already erected seven, and these unquestionably attest the importance, economy and practical utility of his views. The floors are complete, and require only a visit to realise their power and efficiency. The ordinary burning-house appliances are unique in construction, with every regard to economy of labour. This principle has been carried out in detail throughout the whole paraphernalia of dressing and rendering marketable the tin and arsenic. The agents of the Duke of Cornwall pronounce them, we are informed, the most efficient throughout the Duchy. The result of these special appliances of Capt. Pryor is a product of about 550*l.* monthly in arsenic, which otherwise would become lessened and commercially less valuable. These active machines of economy stand boldly forth as a recompense to Messrs. Phillips and Pryor for fearless disregard of every opposition and the conflicting interests of all otherwise than adventurers. There is already erected and brought into action the subjoined powerful field of machinery and plant:—One 80-in. pumping-engine, with 19-in. pitwork fixed to the 86; a second 50-in., and for drainage these are equal to commanding the three tin and the Devon Great Consols lodes to a depth of fully 200 fathoms, which they will not attain for the next fifty years.

As announced by us, the Llanrwst has become an acknowledged success. At the statutory meeting a general feeling of confidence was expressed in favour of the board and local management. Capt. Knap not only confirmed all his previous reports, but volunteered to rest his reputation on results practically exceeding his calculations. He referred with earnest confidence to his career in connection latterly with South Caradon, and for a series of years to the Wheal Wrey, Mary Ann, Trelawny, and Ludcott, as instances of his

careful reporting, while he trusted that all who entertained doubts would send their agents to inspect the workings.

At Bampfylde the yield continues satisfactory, while the reserves of ores, iron, copper and manganese now in stock are respectively 9000, 200, and 160 tons, and the future supplies are represented as likely to augment. These ores, through the completion of the tramway, will soon be brought to market. There has been a fusion of strength introduced into the proprietary of East Balleswidden Mine, and it is highly probable that the shares will become in active demand.—32, Fleet-street, Jan. 7. TREDINNICK AND CO., Mining Engineers, and Dealers in Stocks and Shares.

#### CORNISH MINE MANAGEMENT.

SIR,—Referring to the letter signed "Lex," in last week's Journal, calling in question the propriety of Capt. Goldsworthy and Skewis having the management of so many mines, did it not strike your readers that they, having obtained a reputation by their skill, diligence, and trustworthiness, have justly earned the reward they are now reaping; and, on the other hand, that mining companies feel safer in the hands of such men than in the hands of some "would-be managers." As to Capt. Goldsworthy I have not much knowledge, but from what I have heard I do not wonder at his having so many mines under his control. As to Capt. Skewis I have a pretty good knowledge of his abilities, and I have no hesitation in saying that in none of the mines mentioned is there any real complaint as to neglect of duty or incompetency. Though that gentleman may not visit a mine more than two or three times a month, he has the good fortune to be served with thoroughly good resident agents; such men as Capt. Dunstan, Prowse, Secombe, and Brenton cannot be picked up anywhere, and Capt. Skewis has shown the genius of a general in selecting his men. There is one thing distant shareholders like—to be kept out of the Stannary Court, and in having Capt. Skewis they feel pretty safe on that head; in fact, in the matter of "after calls" the management of Capt. Skewis is almost equal to a register under the Limited Act. While shareholders feel this they will not be likely to allow their mines to be managed by any body. The name "Lex" would seem to indicate that the writer belongs to another profession, yet I am not sure that he is not one who would uncommonly like to manage one or two of those mines. If he could only convince any of the companies of his great merits what a fine thing it would be for him, but "there is the rub."

SHAREHOLDER IN FOUR OF THE MINES MENTIONED.

#### MINERS' CONVERSATIONS—No. XI.

Bill.—What is your opinion of the "strikes" amongst the colliers in South Wales and other places?

John.—I consider them great evils. A strike can be justified only on the ground of a just complaint against the employers which could not be otherwise redressed. In the beginning of the strikes there might be some reason in demanding an increase of pay, and a little diminution of hours of labour, which were conceded, but the miners who assumed the position of dictators have been pushing forward their demands to an iniquitous extent. It appears that they are never satisfied with any concession. It would serve them right if the Cornish miners supplanted them all. I mean by taking their places at the mines, as has been done in a mine or two. The employer and the employed are mutually dependent, but "reason should rule." The miners who went from Cornwall to the coal mines earn double the wages they got at home.

Bill.—The miners of Cornwall have not followed the colliers in their strikes: how do you account for that?

John.—On the ground of their good conduct and reasonable nature. Those who have obtained their object—increased wages and less hours—have shown their dishonesty by doing less work than they did before. But their unrighteousness will bring upon them retribution.

Bill.—In what way?

John.—Ultimate diminution of wages, probably below the old scale.

Bill.—How can you show that?

John.—The high price of coal, consequent on the strikes and their results, has stimulated the industry of other countries to increase very largely their production of coal, and which has already led to a decrease in our exportation of the article. This will lead, I suppose, to an importation of coal into England, which will most surely bring down the price both of coal and labour at home. The present may be regarded as an artificial price, bearing heavily on the mines and the poor.

Bill.—I have read that the increase in the colliers' pay has done them no good, for instead of taking the money home to their families they have spent it in publichouses.

John.—That is true, and is another proof of the badness of their character. The innkeepers and beer shopkeepers have been the real gainers by the strikes—men who live upon the sinful, sensual propensities of mankind.

Bill.—I see that the *Mining Journal* has a letter or two every week about the four and five weeks month. What is your opinion as to the utility of the change which has been made in some mines by the adoption of a rule to pay every four weeks?

John.—Although willing to have my pay as early as I can, I consider the change of very little value to the miners, and of great inconvenience to the mining companies who have adopted it.

Bill.—How can that be?

John.—You know that a five-weeks month comes only once a quarter. That man must be a very bad manager of his gettings not to provide for the fifth week four times a year. It has been proved that as regards the amount paid in such mines there is very little difference in the wages. The men have much the same as they had before the change. Most mines are too poor to admit of much increase to men's wages, everything required by mines being so dear. If men who are so short of cash as to require an advance from the purser for the fifth week they can have subsist by asking for it. I know that Captain Pryor expressed his readiness to advance money in his mines in such cases.

Bill.—But what inconvenience can result to the adventurers from the change?

John.—You know that there is no thirteenth month in our calendar. The year comprises only twelve months—January to December, both inclusive. Therefore the four-weeks accounts cannot be brought within these long-recognised periods, and yet they do so nominally, leaving, I suppose, the thirteenth week to be charged at the year's end. So that January or December month's cost, so called, in the cost-book is not really all the cost of the month, but only 28-31sts of the cost. I believe that the mining companies will either return to the old calendar-monthly payments, or pay the men weekly.

Bill.—The class of labourers who, of all in the country, could reasonably "strike" is that of farm labourers. No men were so badly paid as they, nor any who so quietly endured their yoke. And yet it was a long time before they moved for an increase, and that in very few places. Their case was considered, and their wages raised from about 9*l.* or 10*l.* per week to 14*l.* or 16*l.* In addition to which they have, in some places, a cottage and garden, and, perhaps, a place wherein to rear a pig.

John.—And what a slight pay, after all, that is for a man, his wife, and children! But it is nearly as much as railway porters receive. That is another class of men shamefully paid, and yet they are forbidden the acceptance of any gratuity from a passenger! The postmen's is the third class of badly paid servants. Their salary is even worse, I believe, than that of the porters on railways!

Bill.—I was glad to hear a few days ago that an improvement has taken place in Crenver and Abraham Mines.

John.—So was I; and I hope that it will lead to a rich deposit, sufficient to repay the company all their outlay, with good profits beyond that. I saw a letter in the Journal two or three months ago, expressing an opinion that the lode should be tried deeper.

Bill.—That is what they are doing. I am very glad that Messrs. Williams and Co., the bankers, are to have the balance of the purchase-money which the company agreed to pay for this mine; but the directors, after paying 28,000*l.* out of 30,000*l.*, tried upon a point of law to evade the payment of the balance, but the judges have decided that the balance must be paid.

John.—It looked much like a trick to evade the payment of a

just claim. You may call such men honest if you please; have my opinion respecting them.

Bill.—Is it true that Captain J. Thomas condemned Crenver and Abraham?

John.—Yes; but you know that Capt. Thomas, although a very nice man as a master and neighbour, was never a practical man like ourselves, so that I don't think him qualified to give an opinion on a mine like one who has had great experience, like Capt. Tregay, who reported favourably on the mine. Anyone can manage a rich mine like Dolcoath, but Capt. Josiah never discovered a good mine. The manager of New Great Consols is the man for finding good mines, and for knowing how to report correctly on any.

St. Just, Dec. 30.

AGENT.

#### LEGITIMATE MINING.

SIR,—In my former letters of this series I endeavoured to direct your attention to the fact that the word "legitimate" as much and as forcibly applies to the judgment of men as exercised in the selection of mines, and the motives by which their purchase is induced, as it does to the choice of means and the general conduct of the agents employed to develop them. Mining differs in this respect from almost every other pursuit. It would be a palpable waste of superior skill in the arts to bestow it upon objects which consisted of an inferior material, as the natural inferiority of such objects would assert itself in defiance of the best workmanship which might be applied to its dressing (unless the texture of the material was effectually concealed by some artificial surrounding), and create such a disparity between the real value of the material and the decorative art applied to its adornment as would only increase in proportion as the contrast was intensified. But not so in mining, as superior skill, practically exercised on legitimate principles, whenever and wherever applied, must always be in harmony with its effects, and, *vice versa*, its effects with it. But no subsequent exercise of practical skill can ever counteract the consequential effects of errors committed in the selection of inferior mines, especially when such are commended to the public as first-class channels of investment. Nor can it ever counterbalance the difference which will arise, and continue to repeat itself, in respect to the rates of purchase, as the relation between invested capital and the accruing interest is a self-asserting and continually repeating issue. The evil effects of buying mines at double their value do not end in a diminished interest upon the capital invested, but extends itself into the arena of their practical operations, and by unduly taxing their resources limit and weaken the channels of productiveness, a *regime* which has been found but too fatal to many mines. If in the early stages of mining the exploratory operations are not largely in excess of the scale upon which the extraction of ores is carried on, a forced and unnatural condition of things must prevail, which always, sooner or later, brings its own punishment—sooner in a majority of instances is the rule; and such a course operates with very damaging effects not only upon individual adventures, but against the general interests of mining. To wrench from the best of mines a given quantity of ores to the fullest extent of their capacity in a given time would be to institute a measure which, in proportion to the fidelity of its observance, would be its tendency to lessen and deteriorate the channels and sources of its own prosperity. When the awful fiat goes forth—"It must be done," "There is no help for it," "It is imperatively called for by the situation," "No one is responsible for events which could not by possibility have been foreseen, and arising from circumstances over which no one has any control,"—it is needless to say that this is a juncture which portends the sacrifice of natural valuable channels of wealth to individual caprice or cupidity. Many a good mine, and especially American mines, has been sacrificed in this way, and whilst no one is said to be responsible for such unfortunate occurrences it is generally easy to trace the evil to its source, and latterly to find in a large number of cases that it originated in a circle beyond the sphere in which the executive moved, and over which the members of that department had not the least control. The suitable and timely adaptation of means to an end is an important part of legitimate mining, whether practically or commercially considered, and is that which conduces as largely to its success as any differences which are usually found in the natural channels are capable of producing.

With regard to the practical part of mining there are also two divisions. One respects the general outline, the other the multifarious detail. The general outline of a mine is usually methodically arranged in agreement with sundry ideas of objects and ascertained facts known or reasonably assumed to be comprised within certain defined limits of ground proposed to be submitted to experimentation, their qualities and other leading features being taken into account. And here the term legitimate, according to the definition we have given of it, beautifully applies. The arrangement of means to an end, according to an ascertained outline of natural objects which are intended for a costly and protracted development—mostly concealed but partly revealing themselves—is of vast importance, as the means usually resorted to in this division of mining are of that character which increasingly extend themselves, and become commensurately expensive, expanding fixtures, and which, if wrongly planned, must either result in a partial or a total failure. It hence becomes apparent that in proportion to the accuracy with which the primary objects are apprehended will, in all probability, be the adaptation and efficiency of the means employed for their investiture and development, each of which, either separately or combined, form not only integral parts, but become auxiliaries of whatever success may be achieved. If an ill devised and incongruous plan be put into execution, one not fitted to operate naturally, such a want of harmony will conduce to disorder, and not only tend to retard the general progress, but to increase the expenses.

The practical operations in mining may be so awkwardly arranged that 50 to 100, or more, per cent., both in money and time, may be required to accomplish a similar amount of effective work than if they had been more consistently and methodically arranged. On the eligibility of the site which may be selected for an engine-shaft sometimes depends the success of a mine, and not unfrequently the measure of such success to an extent scarcely credible, and hence it becomes necessary to institute the most thorough superficial examination of the entire area of a mineral grant, or, at least, as much of it as can conveniently be commanded by each leading shaft as a working centre, and all the prominent features of which should be constantly kept in view, so that all changes arising from the various intersections, whether of the lodes themselves intersecting each other, or their being intersected by slides, cross-courses, or elvans, in order that the probable effects of such occurrences may be looked for in advance, so as to avoid disappointment on the one hand, and undue excitement on the other. Enthusiasm will always be stimulated by such occurrences, whatever precautionary measures may be adopted. Whatever they portend, whether favourable or otherwise, there is an incentive to anxiety, stimulated by certain clearly outlined expectations. To compass ends most effectually by the cheapest and quickest means, provided the objects are sufficiently comprehensive and understood, comprises all that is included in the term "legitimate" in its application to practical mining, whether relating to the general outline or its no less important detail. To particularise the detail of mining, or to criticise the methods employed in such detail individually, would be an almost endless task, and one sufficiently embarrassing to tax higher attributes than those possessed by men. It is only a few general remarks which anyone can venture to hazard on such a subject, as the testimony of individual experience is so widely conflicting. Such a state of things may arise from—to ordinary observers—imperceptible shades of differences pertaining to different mines and to different circumstances regarding them, which in the aggregate might suffice to constitute a decided peculiarity, and require, to be successfully met, an extensive modification of the ordinary appliances. Or, in case the mechanical arrangements should be of the most approved and efficient character, the skill and judgment displayed in their operation may be faulty in a very marked degree, and in consequence of which very indifferent, if any, success at all will be achieved.

Market operations, too, sometimes oppose themselves to legitimate mining. When these interests are made paramount they necessarily oppose themselves to legitimate progress, as the means employed to consummate individual objects are just those which











## WHAT HONEST AND INTELLIGENT MANAGEMENT WILL DO FOR THE GREAT MINES OF UTAH.

**THE RED AND BENSON.**—The Big Cottonwood mining district adjoins Little Cottonwood on the north, and Parley's Park on the south. It is well watered and timbered, and the road up the canyon is the finest mountain road in Utah. The scenery is unsurpassed, the mountain peaks are bold and grand, and some of the views are said to rival those of Yosemite. The development of the mines of this district has been slow, and the expenditure of money has been made by individuals instead of by large capitalised companies. It has had no resident newspaper correspondent to advertise it. Its popularity among visitors at the present time is attributable solely to its merits as a rich mineral location. Although only a single ridge of mountains separates it from Little Cottonwood, the veins are entirely different in their characteristics, and the ore on an average valuation very much richer.

The ledges of the prominent mines in Big Cottonwood are fissure veins, while those on Emma Hill are strata veins; besides, the gangue of the Emma ore carries about 20 per cent. silica, while the best mines of Big Cottonwood carry only about 10 per cent. The other belt commences at the celebrated Flagstaff Mine on Emma Hill, and runs in a direct course over Kessler's Peak Grizzly Flat, Little Cottonwood, running north, taking in Silver Fork and Honey Comb Gulch, though not, as far as discovered, crossing the canyon. On this belt are the Highland Chief, Wellington, Prince of Wales, Richmond, and other mines. The Highland Chief has been worked considerably, and the quantity of ore taken from it, and now in sight, decides it to be very valuable property. The others are partially developed, yielding good ore, which determines the fact that they are promising and rich prospects. These veins are true fissures, traceable for a long distance, and regular in their course. The other belt commences at the celebrated Flagstaff Mine on Emma Hill, and runs in a direct course over Kessler's Peak Grizzly Flat, Little Cottonwood, running north, taking in Silver Fork and Honey Comb Gulch, though not, as far as discovered, crossing the canyon. On this belt are the Highland Chief, Wellington, Prince of Wales, Richmond, and other mines. The Highland Chief has been worked considerably, and the quantity of ore taken from it, and now in sight, decides it to be very valuable property. The others are partially developed, yielding good ore, which determines the fact that they are promising and rich prospects. These veins are true fissures, traceable for a long distance, and regular in their course.

The mine is located a very short distance over the divide from Little Cottonwood, in what is known as the South Fork of Big Cottonwood canyon, and about ½ mile on a direct line from the Flagstaff. It has been visited by most of the experts and practical men who have visited Salt Lake City, and from the first has been considered a first-class property. We make a quotation from Mr. Henry Sewell's letter to the *London Mining Journal*, of August 15, 1872, and published in that paper on Sept. 7 following:—"Those of Spain (referring to the mineral veins) are similar to those found in Utah and Nevada, producing similar classes of ore, carbonates of lead rich in silver, and mostly strata veins. In the vicinity of the Almaden mines, I found them to consist mostly of contact veins, having the limestone as a hanging-wall, and sandstone as a footwall. In Utah I have found that most of the veins in limestone are strata veins, such as the Emma, Flagstaff, and other mines. The Red and Benson Mine, in Big Cottonwood, in the Wasatch range, is composed of a fissure vein cutting the strata, and joined at a depth of 60 ft. from the surface by two strata veins, where the large chamber of ore was discovered."

The main formation of the mountain is silica, lime and trap, or what is now commonly termed porphyritic blende rock, and to all external appearance a regular stratified formation, the vein cutting through the lime strata to the surface, at a vertical elevation of 1300 ft. above the valley. The lime strata continuing as the east wall of the lode to the depth of 600 ft. perpendicular from the outcrop, and about 650 ft. lineal (so far developed), while the hanging-wall is perfectly regular and unbroken the same distance, and carrying over 80 per cent. of silica. The ore and vein matter attaining from the surface to the depth of 150 ft., the extreme of 15 ft. in width, while the vein matter, now being worked at the depth of 600 ft., has attained an average width of over 60 ft. This is conclusive that, as the mine is developed in depth, the body of mineral will continue to increase until the main floor of the mine is reached, which will be at a perpendicular depth of 1200 ft., when both walls will be regular, and the principal and main body of ore exposed. The other mines on the belt are the McDougald and Saylor Jack, on Kessler's Peak, the Montreal, on Montreal Hill, and many other prospects of a very flattering character, that need only capital and careful working to develop into good and rich properties.—*Mining Gazette*, Salt Lake City, Utah, Dec. 13.

**STEEFFELDT FURNACE COMPANY.**—Since I received the telegram, announcing the complete victory of the suit instituted by the above company against the Aiken infringement and fraud, I have received private advices that the stock of the company has risen considerably. The company have already spent \$15,000 in various suits, and have always come out victorious. I, therefore, notify those individuals who have been fraudulently circumventing the patent of the above company, in company with Mr. Aiken, to desist from using the patent, otherwise the damages will be made rather heavier than they imagine, this besides the royalty on the ore that they have already worked. The legal powers for proceeding against all infringers will be here in a day or two.—*HENRY SEWELL*: Agent for the Steeffeldt Furnace Company.

**THE EMMA STRIKE.**—The recent strike in the Emma Mine continues to be the subject of much comment in mining circles, and many rumours are in circulation concerning the extent of the ore. Some say the new vein is 10 ft. in width, while others claim to have definite information of the width of the ore at 4 ft. There can be no doubt that the body of ore in the new workings is one of the most extensive yet discovered in this celebrated mine. The Emma officials are noted for keeping the affairs of the company and the condition of the mine from the public, and concerning this last strike they remain unusually silent. Should the body of ore prove anything like as extensive and rich as some say it is, a sudden upward tendency in the stock will soon be observed.

**STRIKE IN THE DAVENPORT.**—A strike, which is said to be the richest and most extensive ever found in the Davenport Mine, Little Cottonwood, was made last week. The new find is 40 ft. below the track level, and is about 8 ft. wide, and of grey carbonates and chlorides. The miners are now taking out immense quantities of ore from the new workings.—*Salt Lake Herald*, Dec. 12.

**FLAGSTAFF MINE—SUDDEN RETRIBUTION.**—Maxwell, the ex-superintendent of the Flagstaff Mine, in Little Cottonwood, has not made much by opening his heart and a budget of figures to our contemporary. It was amusing enough to read the attack of "E. L." in *St. Louis* upon the personal character and ability of Capt. Forbes, an English gentleman of the highest social and financial position in London; but it was rather more than amusing to read the details and assumed facts of the Flagstaff business in the *London Mining Journal*. It is not unnatural for men to be vindictive, but it is sometimes a costly luxury. Marshal Patrick will hereafter look after the Flagstaff.

**THE EMMA MINE.**—We understand that Mr. H. Sewell cabled for 60 Emma shares yesterday. The answer was—"Bought 60 at 27 ½." That is right; let the Salt Lake prove their faith in their mines by deeds instead of words, and show our British cousins what we are made of. We have here a tangible proof of Mr. Sewell's opinion of the present management of the Emma Mine.

**CAMP FLOYD MILL.**—Yesterday we saw a letter from Lewiston, in which it was stated that this mill, notwithstanding the severe frost, was running steadily, and that five bars of silver bullion would be forwarded by Friday to the First National Bank. Neither elements or human beings appear to succeed in trying to freeze out this successful mill.—*Salt Lake Tribune*, Dec. 18.

**MINERAL RESOURCES OF NEW SOUTH WALES.**—A well-executed map of the colony, recently issued by the proprietors of the *Mining Herald and Mail*, Sydney, has been published in this country by Mr. G. STREET, of Cornhill; it gives valuable information as to the mineral and other resources of the colony, and as the details are collated from the official surveys and other equally good sources, full reliance may be placed in its accuracy. The explanatory note and references indicate the extent of railroads, telegraph lines, and public roads, land capable of cultivation for various kinds of produce, including the vine, sugar, tobacco, &c. Besides gold and most other metals which the colony is well known to possess, it will be noticed with some interest just now how large are the tracts of coal-bearing country. The map is not published for sale, but for distribution. Mr. Street has also forwarded excellent portraits of the Duke of Edinburgh and the Czarina Marie of Russia from blocks specially prepared for the proprietors of the newspapers already mentioned. The workmanship is all that can be desired, and in New South Wales the portraits cannot fail to be appreciated.

**TURBINES.**—A turbine constructed according to the invention of Mr. E. OHL, engineer, Bismarck, consists in forming what is termed a reverse float on the convex side of the usual float. This reverse float has a port opening into the ordinary float or bucket, which may be formed by a steel guard cast on the sides of the turbine. There is an opening from the reverse float through the sides of the turbine, through which the float or bucket is ventilated, the air passing through the port or opening from the reverse float to the ordinary float. It will thus be seen that the turbine bucketing is ventilated. This arrangement of a ventilating reverse float may be applied to any hydraulic impacting motor.

**LONDON GENERAL OMNIBUS COMPANY.**—Traffic receipts for the week ending January 4, 1874, 10s. 5d.

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**MANUFACTURE OF COCOA.**—"We will now give an account of the process adopted by Messrs. James Epps and Co., manufacturers of dietetic articles, at their works in the Euston-road, London."—See article in *Crossell's Household Guide*.

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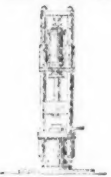
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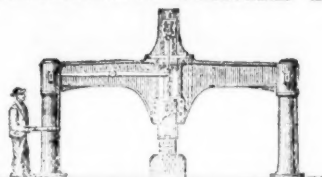
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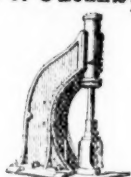
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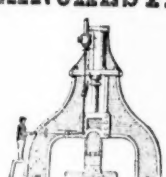
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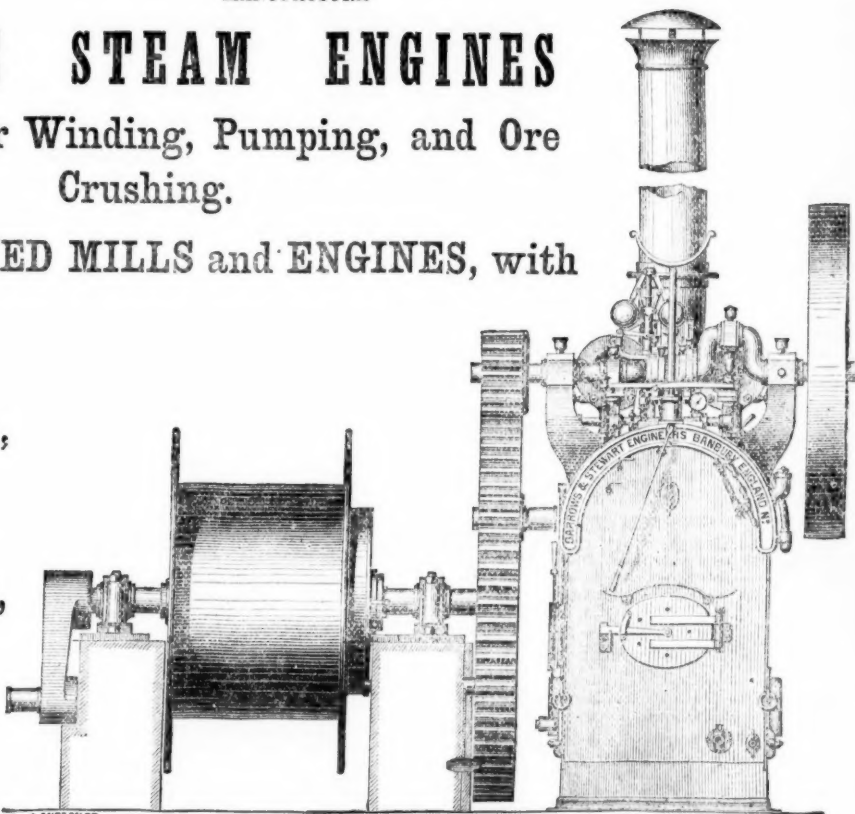
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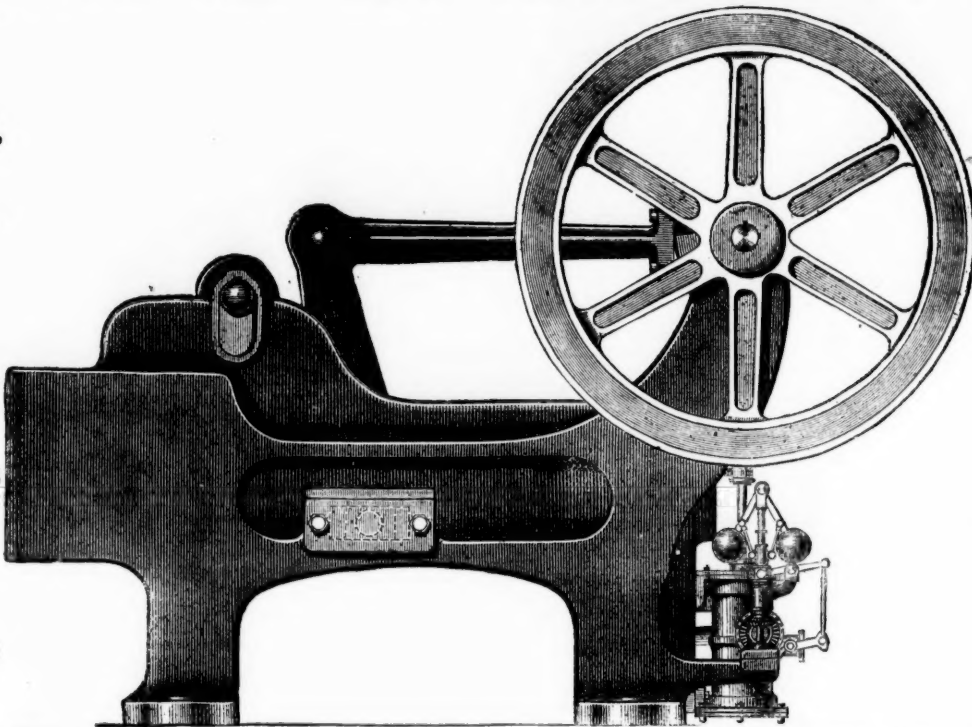
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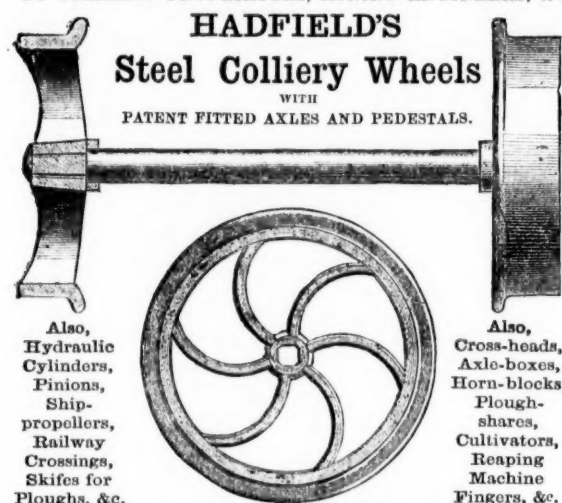
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MERCHANTS AND SHIPPERS OF MACHINERY, METALS, AND HARDWARE.

AWARDED

THE FIRST PRIZE MEDAL AT THE EXPOSITION UNIVERSELLE, PARIS, 1867, "For Improved Construction, Excellence of Material, and Superior Workmanship."  
TWO GRAND GOLD MEDALS AT THE MOSCOW INTERNATIONAL EXHIBITION, 1872. THE FIRST PRIZE MEDALS AT LEEDS AND LYONS IN 1855, 1856, AND 1872.  
Also, THE MEDAL FOR MERIT AT THE VIENNA EXHIBITION OF 1873, "For Excellence in Material and Workmanship, the Employment of Improved Tools and  
Machinery, and the Opening of New Markets."

REDUCTION IN PRICE OF FEET'S VALVES, CONSEQUENT UPON LARGELY INCREASED SALES.

ILLUSTRATED CATALOGUES AND ESTIMATES ON APPLICATION.

Correspondence conducted in English, German, and French.